CLAIMS

1. A sound generator circuit (22) including a piezoelectric vibrator which generates a sound in response to an electric signal, and which also generates an electric signal in response to an acoustic wave.

2. The sound generator circuit according to claim 1, comprising switching means arranged to be switched on and off upon receiving a control signal (V_{CC}), as well as a circuit branch in which a coil (L_3) and a diode (D_3) are mounted in series, a resistor (R') and the piezoelectric vibrator (P_3) being connected in parallel across said circuit branch.

3. The sound generator according to claim 2, characterised in that the switching means include a transistor (T_{R3}).

4. Electronic converter (20) including a sound generator circuit (22) provided with a piezoelectric vibrator (P_3) as well as means supplying a reference voltage, characterised in that it further includes comparison means which compare the reference voltage to the voltage generated by the piezoelectric vibrator (P_3) when the latter picks up an acoustic wave, said comparison means generating a pseudo-digital signal when the voltage generated by said vibrator (P_3) exceeds said reference voltage.

5. Converter according to claim 4, characterised in that the reference voltage is the supply voltage (E) which allows a current to flow in the sound generator circuit (22).

6. Converter according to any of claims 4 or 5, characterised in that the comparison means include an analogue-digital comparator (COMP).

7. Converter according to any of claims 4 to 6, characterised in that the pseudo-digital signal generated by the comparison means is used to control the functions of a microprocessor (MP).

8. Converter according to any of claims 4 to 7, characterised in that the sound generator circuit (22) includes switching means arranged to be switched on and off upon receiving a control signal (V_{CC}), as well as a circuit branch in which a coil (L_3) and a diode (D_3) are mounted in series, a resistor (R') and the piezoelectric vibrator (P_3) being connected in parallel across said circuit branch.

9. Converter according to claim 8, characterised in that the switching means include a transistor (T_{R3}).

10. Converter according to claims 8 or 9, characterised in that the control voltage (V_{CC}) is equal to 3 V, in that the capacitance of the piezoelectric vibrators (P_3)

is of the order of 10 nF, and in that the inductance of the coils (L_3) is of the order of 50 mH.

11. Converter according to claim 10, characterised in that the frequency-transfer characteristic of said converter (20) is centred on a frequency of 2.4 kHz, and in that the transmission bandwidth of said transfer characteristic is of the order of 1 kHz.

12. Timepiece including an electronic converter (20) according to any of claims 4 to 11.

13. Two-directional communication method via acoustic waves between an emitter unit (26) and a receiver unit (28), each of these two units (26, 28) including a microprocessor (MP) and an electronic converter (20), said converter (20) including a sound generator circuit (22) provided with a piezoelectric vibrator (P_3) as well as means supplying a reference voltage, the method being characterised in that:

- the sound generator circuit (22) includes switching means arranged to be switched on and off on receiving a pulsed control signal (V_{CC});

- the electronic converter (20) also includes comparison means which compare the reference voltage to a voltage generated by the piezoelectric vibrator (P_3) when the latter picks up an acoustic wave, these comparison means generating a pseudo-digital signal formed of a succession of logic pulses when the voltage generated by said vibrator (P_3) exceeds the reference voltage;

- as long as the emitter (26) and receiver (28) are idle, the microprocessor (MP) of the receiver (28) waits for a sound signal;

- as soon as the emitter (26) sends the first of a series of successive acoustic " beeps ", the microprocessor (MP) of the receiver (28) instructs a time counter to start and begins to count the number of logic pulses generated by the comparison means, so that said microprocessor (MP) can calculate the number of pulses received in a given time interval, and determine by reading in a counter whether the logic level is " 0 " or " 1 ".

14. Method according to claim 13, characterised in that each " 0 " or " 1 " logic level corresponds to a long " beep " or a short " beep ", two successive acoustic " beeps " being separated by a silent period during which the emitter (26) does not emit.

15. Method according to claim 14, characterised in that the frequency of the pulsed control signal (V_{CC}) applied to the switching means of the emitter (26) is 2 kHz, in that the duration of a short " beep " is 20 ms and the duration of a long " beep " is 100 ms, and in that the duration of the silent period separating two successive " beeps " is 10 ms.

16. Method according to claim 13, characterised in that frequency shift keying " FSK " coding is used.

17. Method according to claim 16, characterised in that the duration of the acoustic " beeps " emitted by the emitter (26) is 100 ms, and in that the frequency of the pulsed control signal (V_{CC}) applied to the switching means of the emitter (26) is 1.5 kHz for an acoustic " beep " corresponding to a " 0 " logic level, and 2.5 kHz for an acoustic " beep " corresponding to a " 1 " logic level.